

## Chapter 4: measures of dispersions IQV

1) Measure of dispersion in qualitative variables.

	IQV	Variance	St.d.
Nominal variable	Yes	No	No
Ordinal variable	Yes	No	No
Interval/ratio variable	Yes	Yes	Yes

2) What is IQV (Index of Qualitative Variations/variables)

$$IQV = \frac{K(100^2 - \sum Pct^2)}{100^2(K - 1)}$$

*K: total number of groups; Pct: percentage of each group*

3) Example

	Fayetteville AR 2020		
White	74%		
Black	6%		
Asian	3%		
Hispanics	9%		
Others	8%		
IQVs	54%		

$$IQV = \frac{K(100^2 - \sum Pct^2)}{100^2(K - 1)}$$

$$IQV = \frac{5 \times (10000 - (74^2 + 6^2 + 3^2 + 9^2 + 8^2))}{10000 \times 4} = 54\%$$

4) Interpretations

$$0 \leq IQV \leq 1 \text{ or } 100\%$$

When IQV is close to 0, it means the group dispersion is minimum, when IQV is close to 1 or 100%, it means the group dispersion is great.

For example, in terms of racial composition, if IQV is 80%, compared with IQV being 20%. The former means the racial diversity is very high, whereas the latter means the racial diversity is low.

5) Exercise

	Fayetteville AR 2020	Fayetteville AR 2000
White	74%	84%
Black	6%	5%
Asian	3%	3%
Hispanics	9%	5%
Others	8%	3%
IQVs	54%	36%

$$IQV = \frac{K(100^2 - \sum Pct^2)}{100^2(K - 1)}$$

6) IQV computations with numbers not percentages

	Fayetteville AR 2020	Springdale AR 2020
White	74%	34,543
Black	6%	1,733
Asian	3%	1,791
Hispanics	9%	33,287
Others	8%	12,807
Total Pop	100%	84,161
IQVs	54%	81%